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**PATENT** 



Docket No.: 50229-429

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Customer Number: 20277

Jurgen ROHR, et al. : Confirmation Number: 9088

Application No.: 10/796,304 : Group Art Unit: 1645

Filed: March 10, 2004 : Examiner: Not yet assigned

For: DERIVATIVES OF MITHRAMYCIN AND METHODS OF MAKING AND USES

**THEREOF** 

## **INFORMATION DISCLOSURE STATEMENT**

Mail Stop Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Dear Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached form PTO-1449. It is respectfully requested that the documents be expressly considered during the prosecution of this application, and that the documents be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is being filed within three months of the U.S. filing date OR before the mailing date of a first Office Action on the merits. No certification or fee is required.

## 10/796,304

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Cameron K. Weiffenbach Registration No. 44,488

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Facsimile: 202.756.8087 **Date: January 14, 2005** 

Please recognize our Customer No. 20277 as our correspondence address.

SHEET 1 OF 3

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| INFORMATION DISCLOSURE  |             |   |                           |                             | ATTY. DOCKET NO. SERIAL NO.                        |               |   |           |                 |  |
|   |             |   |                           |                             | 50229-429  | 10            | /796,3  | 04        |                 |  |
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|   |             |   |                           |                             | Jurgen ROHR, et al.                                |               |   |           |                 |  |
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| (PTO-1449)  |             |   |                           |                             | March 10, 2004                                     |               | 345   |           |                 |  |
| U.S. PATENT   |             |   |                           |                             | T DOCUMENTS  |               |   |           |                 |  |
| EXAMINER'S  | CITE        | Į.  | Document Number           | Publication Dat             |  | and of Cited  | l Bees  | - Calumna | Lines M/hors    |  |
| INITIALS  | NO.         | Nur   | mber-Kind Code2 (# known) | MM-DD-YYYY                  |  | cant of Cited | Pages, Columns, Lines, When<br>Relevant Passages or Relevar<br>Figures Appear |           |                 |  |
|   | <u> </u>    | US  | 3,592,925                 | 07-13-1971                  | R.H. Evans, JR., e                                 | t al.         |   |           |                 |  |
|   |             | us  | 3,646,194                 | 02-29-1972                  | B. A. Sobin, et a                                  |               | 1   |           |                 |  |
| <del></del>   |             | us  | 3,821,085                 | 06-28-1974                  | Zhdanovich et a                                    | al.           | <del>                                     </del>                              |           |                 |  |
|   |             | us  | 3,906,093                 | 09-16-1975                  | Sobin et al.                                       |               |   |           |                 |  |
|   |             | υs  | 4,141,974                 | 02-27-1979                  | Davies et al.                                      |               |   |           |                 |  |
|   | ĺ           | US  | 4,452,786                 | 06-05-1984                  | Mitsuhashi et a                                    | il.           |   |           |                 |  |
|   | <u> </u>    | US  | 4,511,560                 | 04-16-1985                  | Tomita et al.                                      |               |   |           |                 |  |
|   |             | US  | 4,935,445                 | 06-19-1990                  | Merry  | Merry         |   |           |                 |  |
|   |             | US  | 5,057,034                 | 10-15-1991                  | Kretzschmar et al.                                 |               |   |           |                 |  |
|   |             | US  | 5,656,736                 | 08-12-1997                  | Nakano et al.                                      |               |   |           |                 |  |
|   |             | US  | 5,723,448                 | 03-03-1998                  | Gross et al.                                       | Gross et al.  |   |           |                 |  |
|   |             | US  |                           |                             |  |               |   |           |                 |  |
|   |             | US  |                           |                             |  |               |   |           |                 |  |
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| FOREIGN PATENT DOCUMENTS  |             |   |                           |                             |  |               |   |           |                 |  |
| EXAMINER'S<br>INITIALS  | CITE<br>NO. | Foreign Patent Document Country Codes -Number 4 -Kind Codes (if known)  |                           | Publication Date MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Where Re      | Columns, Lines ere Relevant ures Appear Yes No                                |           | anslation<br>No |  |
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| OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)  EXAMINER'S Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, |             |   |                           |                             |  |               |   |           |                 |  |
| INITIALS  | CITE<br>NO. | ipurnal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where |                           |                             |  |               |   |           |                 |  |
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| INFORMATION DISCLOSURE<br>CITATION IN AN<br>APPLICATION |             |   |                             | ATTY. DOCKET NO. 50229-429  |             | SERIAL NO.<br>10/796,304  |             |         |  |
|---|-------------|---|-----------------------------|---|-------------|---|-------------|---------|--|
|   |             |   |                             | APPLICANT Jurgen ROHR, et al.   |             |   |             |         |  |
| (PTO-1449)  |             |   |                             | FILING DATE GROUP 1645  |             |   |             |         |  |
|   |             | U   | .S. PATEN                   | T DOCUMENTS   |             |   |             |         |  |
| EXAMINER'S<br>INITIALS                                  | CITE<br>NO. | Document Number<br>Number-Kind Code2 (# known)  | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Pages, Columns, L Document Relevant Passages Figures App |             |   | or Relevant |         |  |
|   |             | US  | 50051011.01                 |   |             |   |             |         |  |
| EXAMINER'S  | 1           | Foreign Patent Document   | Publication Date            | ATENT DOCUMENTS  Name of Patentee or  | Pages Colum | ages, Columns, Lines Tran<br>Where Relevant<br>Figures Appear Yes |             | slation |  |
| INITIALS  | CITE<br>NO. | Country Codes -Number 4 -Kind<br>Codes (if known)   | MM-DD-YYYY                  | Applicant of Cited Document   | Where Re    |   |             | No      |  |
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| EXAMINER'S  | Τ           |   | , ,                         | or, Title, Date, Pertinent Pages, E   |             | ne item (bo   | ok manazine |         |  |
| INITIALS  | CITE<br>NO. |   |                             |   |             |   |             |         |  |
|   | ,           | Lily L. REMSING, et al. "Mithramycin SK, A Novel Antitumor Drug with Improved Therapeutic Index, Mithramycin SA, and Demycarosyl-mithramycin SK: Three New Products Generated in the Mithramycin Producer Streptomyces argillaceus through Combinatorial Biosynthesis" J. AM. CHEM. SOC. 2003, 125, pp. 5745-5753 |                             |   |             |   |             |         |  |
|   |             | Robert J. FERRANTE, et al. "Chemotherapy for the Brain: Mithramycin Prolongs Survival in a Model of Huntington's Disease"   |                             |   |             |   |             |         |  |
|   |             | L. PRADO, et al. "Analysis of two chromosomal regions adjacent to genes for a type II polyketide synthase involved in the biosynthesis of the antitumor polyketide mithramycin in Streptomyces argillaceus." 1: Mol Gen Genet. 1999  Mar;261(2):216-25.   |                             |   |             |   |             |         |  |
|   |             | G. BLANCO, et al. "Characterization of two glycosyltransferases involved in early glycosylation steps during biosynthesis of the antitumor polyketide mithramycin by STreptomyces argillaceus." 1: Mol Gen Genet. 2000  Jan;262(6):991-1000.  |                             |   |             |   |             |         |  |
|   |             | MJ LOZANO, et al. "Characterization of two polyketide methyltransferases involved in the biosynthesis of the antitumor drug mithramycin by Steptomyces argillaceus." 1: J Biol Chem. 2000 Feb 4;275(5):3065-74.   |                             |   |             |   |             |         |  |
|   |             | J. KANTOLA, et al. "Folding of the polyketide chain is not dictated by minimal polyketide synthase in the biosynthesis of mithramycin and anthracycline." 1: Chem Biol. 1997 Oct;4(10):751-5.   |                             |   |             |   |             |         |  |
|   |             | L. PRADO, et al. "Oxidative cleavage of premithramycin B is one of the last steps in the blosynthesis of the antitumor drug mithramycin." 1: Chem Biol. 1999 Jan;6(1):19-30.  |                             |   |             |   |             |         |  |
|   |             | E. FERNANDEZ, et al. "Identification of two genes from Steptomyces argillaceus encoding glycosyltransferases involved in transfer of a disaccharide during biosynthesis of the antitumor drug mithramycin." 1: J Bacteriol. 1998 Sep;180(18):4929-37.   |                             |   |             |   |             |         |  |
|   |             | D RODRIGUEZ, et al. "Purification and characterization of a monooxygenase involved in the biosynthetic pathway of the antitumor drug mithramycin." 1: J Bacteriol. 2003 Jul;185(13):3962-5.   |                             |   |             |   |             |         |  |
|   |             | D RODRIGUEZ, et al. "MtmMll-mediated C-methylation during biosynthesis of the antitumor drug mithramycin is essential for biological activity and DNA-drug interaction." 1: J Biol Chem. 2003 Dec 5 [Epub ahead of print].  |                             |   |             |   |             |         |  |
|   |             | A. GONZALEZ, et al. "The mtmVUC genes of the mithramycin gene cluster in Streptomyces argillaceus are involved in the biosynthesis of the sugar moleties." MOLECULAR AND GENERAL GENETICS, (FEB 2001) Vol. 264, No. 6, pp. 827-835. SPRINGER-VERLAG, New York.  |                             |   |             |   |             |         |  |
|   |             | EXAMINER  |                             |   | DATE CONSI  | DERED   |             |         |  |

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|   |             |  |                               | APPLICANT  Jurgen ROHR,              | et al.                            |   |  |  |  |
| (PTO-1449)  |             |  |                               | FILING DATE March 10, 2004           | GROUP<br>1645                     |   |  |  |  |
|   |             | U  | .S. PATEN                     | T DOCUMENTS                          | -                                 |   |  |  |  |
| EXAMINER'S<br>INITIALS                                  | CITE<br>NO. | Document Number<br>Number-Kind Code2 (# known)   | Publication Dat<br>MM-DD-YYYY |                                      | cant of Cited                     | Pages, Columns, Lines, Whe<br>Relevant Passages or Relevant<br>Figures Appear |  |  |  |
|   | <u> </u>    | US   | EODEIGN D                     | ATENT DOCUMENTS                      |                                   | <u> </u>  |  |  |  |
| EXAMINER'S  | 1           | Foreign Patent Document  | Publication Date              |                                      | Pages, Columns, Lines Translation |   |  |  |  |
| INITIALS  | CITE<br>NO. | Country Codes -Number 4 -Kind<br>Codes (if known)  | MM-DD-YYYY                    |                                      | Where Rel                         | Where Relevant Figures Appear  Yes  |  |  |  |
|   | <del></del> | Y  |                               | nor, Title, Date, Pertinent Pages, E |                                   |   |  |  |  |
| EXAMINER'S<br>INITIALS                                  | CITE<br>NO. |  |                               |                                      |                                   |   |  |  |  |
|   |             | Lily L REMSING, et al. "Ketopremithramycins and ketomithramycins, four new aureolic acid-type compounds obtained upon inactivation of two genes involved in the biosysnthesis of the deoxysugar moieties of the antitumor drug mithramycin by Streptomyces argillaceus, reveal novel insights into post-PKS tailoring steps of the mithramycin biosynthetic pathway." JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, (2002 Feb 27) 124 (8) 1606-14.   |                               |                                      |                                   |   |  |  |  |
|   |             | Axel TREFZER, et al. "Rationally designed glycosylated premithramycins: hybrid aromatic polyketides using genes from three different biosynthetic pathways." JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, (2002 May 29) 124 (21) 6056-62.   |                               |                                      |                                   |   |  |  |  |
|   |             | J. PLOWMAN, et al. "Efficacy of the quinocarmycins KW2152 and DX-52-1 against human melanoma lines growing in culture kand in mice." CANCER RESEARCH, (1995 Feb 15) 55 (4) 862-7.  P. H. VIOLLIER, et al. "Role of acid metabolism in Streptomyces coelicolor morphological differentiation and antibiotic biosynthesis." JOURNAL OF BACTERIOLOGY, (2001 May) 183 (10) 3184-92.  |                               |                                      |                                   |   |  |  |  |
|   |             |  |                               |                                      |                                   |   |  |  |  |
|   |             | Lily L REMSING, et al. "Inhibition of c-src transcription by mithramycin: structure-activity relationships of biosynthetically produced mithramycin analogues using the c-src promoter as target." BIOCHEMISTRY, (2003 Jul 15) 42 (27) 8313-24.  K. STAJNER, et al. "Variability and strain selection in Streptomyces atroolivaceus. II. Chromatographic analysis of mithramycin-producing and nonproducing strains." Folia Microbiologica (Prague, Czech Republic) (1974), 19(6), 498-506.  G. BLANCO, et al. "Identification of a sugar flexible glycosyltransferase from Streptomyces olivaceus, the producer of the antitumor polyketide elloramycin." CHEMISTRY AND BIOLOGY, (2001 Mar) 8 (3) 253-63.  M J F LOZANO, et al. "Characterization of two polyketide methyltransferases involved in the biosynthesis of the antitumor drug mithramycin by Streptomyces argillaceus." JOURNAL OF BIOLOGICAL CHEMISTRY, (4 FEB 2000) Vol. 275, No. 5, pp. 3065-3074. Publisher: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, Bethesda, MD. |                               |                                      |                                   |   |  |  |  |
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|   |             |  |                               |                                      |                                   |   |  |  |  |
|   |             | Lily L. REMSING, et al. "Mithramycin SK, a novel aureolic acid-type antitumor compound generated by combinatorial biosynthesis, shows an improved therapeutic index compared to mithramycin in <i>in vitro</i> antitumor and toxicity assays." 2003, American Association for Cancer Research. 2003 Proceedings of the AACR <a href="http://aacr03.agora.com/planner/displayabstract.asp?presentationid=9968">http://aacr03.agora.com/planner/displayabstract.asp?presentationid=9968</a>  |                               |                                      |                                   |   |  |  |  |
|   |             | Sukalyan CHATTERJEE, PhD, et al. "Sequence-Selective DNA Binding Drugs Mithramycin A and Chromomycin A, Are Potent Inhibitors of Neuronal Apoptosis Induced by Oxidative Stress and DNA Damage in Cortical Neurons."  Annals of Neurology, Vol. 49, No. 3, March 2001, Wiley-Liss, Inc., pp. 345-354.  Lily L. REMSING, et al. "Ketopremithramycins and Ketomithramycins, Four New Aureolic Acid-Type Compounds Obtained upon Inactivation of Two Genes Involved in the Biosynthesis of the Deoxysugar Moietles of the Antitumor Drug Mithramycin by Streptomyces Argillaceus, Reveal Novel Insights into Post-PKS Tailoring Steps of the Mithramycin Biosynthetic Pathway." J. AM. CHEM. SOC., Vol. 124, No. 8, 2002, pp. 1606-1614.  |                               |                                      |                                   |   |  |  |  |
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|   |             | EXAMINER   |                               |                                      | DATE CONSID                       | ERED  |  |  |  |

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